Pell Grants as Performance-Based Aid? An Examination of Satisfactory Academic Progress Requirements in the Nation's Largest Need-Based Aid Program

A CAPSEE Working Paper

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Abstract

The Federal Pell Grant Program is the nation's largest need-based grant program. While students' initial eligibility for the Pell is based on financial need, renewal of the award is contingent on their making satisfactory academic progress (SAP)—meeting minimum academic standards similar to those proposed in models of performance-based scholarships. It is not clear how many students are affected by failure to meet SAP standards, or how the policies shape student outcomes. In this study, we draw from literature on performance-based funding and academic probation to consider the potential implications of SAP standards. We describe federal guidelines and illustrate how SAP is evaluated in a statewide community college system. Using administrative data with term-by-term measures of Pell receipt, student grades, attempted and earned credits, persistence, degree attainment, and transfer, we employ regression discontinuity and difference-in-differences approaches to examine the magnitude of SAP failure and its effects. Our results suggest that a substantial portion of Pell recipients at community colleges are at risk for Pell ineligibility due to their failure to meet SAP grade point average (GPA) or credit completion requirements. Approximately a quarter fail to meet the GPA standard alone. When the credit completion requirement is taken into consideration, the first-year SAP failure rate approaches 40 percent. Our preferred difference-in-differences estimates show mixed effects of SAP standards: Failing to meet the GPA requirement has a negative impact on persistence into the second year, but it may improve associate degree attainment and transfer among students who are not discouraged from reenrolling.

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1. Introduction

Many students start college but leave without degrees (Attewell, Heil, & Reisel, 2011; Deil-Amen & DeLuca, 2010). College persistence rates are especially low among students who stand to gain the most from postsecondary education: those from low-income families (Bailey & Dynarski, 2011; Brand & Xie, 2010). While some researchers are skeptical of the relationship between financial constraints and educational outcomes (Cameron & Heckman, 1998; Carneiro & Heckman, 2002; Heckman, 2000; Mayer, 2010), rapidly shifting financial demands, including rising tuition rates, mean that financial constraints are more likely to impact students than ever before. Research consistently suggests that low-income families are particularly sensitive to college prices, even after initial college enrollment (Bowen, Chingos, & McPherson, 2009; Deming & Dynarski, 2010). Need-based financial aid is a widely used tool to promote college attainment, with the federal government delivering $185.1 billion in aid to undergraduates in 2013 (Baum & Payea, 2013).

The Federal Pell Grant Program is the single largest source of need-based financial aid for college students in the United States, providing over $32 billion in grants to nearly 9 million undergraduates (over a third of undergraduates in the 2012–2013 academic year) (Baum & Payea, 2013). While eligibility is initially based purely on financial need, recipients must meet satisfactory academic progress (SAP) requirements in order to remain eligible for Pell Grants beyond the first year. Institutions have flexibility regarding how they define SAP but commonly require students to maintain a cumulative grade point average (GPA) of 2.0 or higher and to complete at least two thirds of the course credits that they attempt. Those who fail to meet the SAP requirements at the end of the institution's evaluation period may continue to receive aid for one additional term, but if they are still failing SAP at the end of that term, they may lose eligibility for Pell.

The academic requirements for Pell Grant renewal have received little attention from researchers and policymakers, despite their potentially broad consequences. Forty-five percent of Pell Grant recipients entering postsecondary institutions do not enroll for a second year of college (authors' calculations).[1] While performance-based scholarships have risen in popularity, the performance-based aspects of the nation's largest need-based grant program have gone virtually unstudied. Do the bureaucratic hurdles posed by SAP standards minimize the Pell's effectiveness? Do they contribute to the observed low rates of persistence? The prevalence of SAP failure and its consequences in terms of Pell loss, persistence, subsequent aid receipt, and degree attainment are unknown.

To our knowledge, this is the first empirical examination of SAP policy since the 1980s (when, soon after the onset of the federal policy, a few institutions examined the effects of SAP

[1] The average rate of reenrollment among Pell recipients was calculated using data from the 2004/2009 Beginning Postsecondary Students Longitudinal Study. The estimates for students attending public two-year colleges, which enroll a disproportionate share of financially disadvantaged students, were similar—approximately 46 percent of Pell recipients at community colleges do not enroll for a second year.

implementation) and the first to use multi-institutional data. Since SAP policy was first enacted, enrollment in college has soared. Educational expansion and increasing diversity among college students, twinned with rising college costs, mean that more students than ever face the potential repercussions of SAP policy. In light of these trends, there is a clear need for more information about SAP policy and its effects on student outcomes; this paper makes several contributions. First, we clearly outline the federal guidelines for SAP evaluation by postsecondary institutions receiving federal financial aid and describe how evaluation is implemented in a state community college system. Second, we theorize how SAP policy may impact student outcomes, drawing from prior research on performance-based aid and academic probation. Third, we provide evidence regarding the prevalence and consequences of SAP failure, using both national data and state administrative data from community colleges.

We find that approximately one in five (21 percent) first-year Pell recipients nationally are at risk of losing their Pell due to the SAP GPA criterion alone. The rates of first-year SAP failure are increasing over time, particularly at community colleges, which in recent years have had the most students at risk (although SAP failure is not unique to these institutions). At community colleges, approximately 25 percent of first-year Pell recipients fail to attain a 2.0 GPA in both national and state administrative data. When we incorporate the credit completion requirement, the overall first-year SAP failure rate approaches 40 percent in our administrative data. It is worth noting that poor performance is by no means limited to Pell recipients; the rates of low academic achievement (i.e., falling below a 2.0 cumulative GPA) are only modestly lower among first-year students not receiving the Pell.

To estimate the consequences of SAP failure, we use both regression-discontinuity (RD) and difference-in-differences (DD) approaches. The RD approach compares outcomes for Pell recipients just above and below the SAP GPA criterion, while the DD approach compares these differences against those for non-Pell recipients (who are also subject to academic probation but do not face the same loss of financial aid). The pattern of results from the two approaches is somewhat different; however, the RD estimates are much less precise (and not statistically significant). Our preferred DD estimates suggest that failing SAP (and thus facing the loss of Pell, beyond any general effects of academic probation) may have heterogeneous effects, decreasing persistence into the subsequent year but increasing eventual degree attainment for those who remain.

The patterns we describe require careful interpretation. Failing SAP does not necessarily imply that a student's decision to enroll in college was a mistake. College is necessarily an experiment; much like investments in small business, some failures are to be expected, and failure does not mean the investment was flawed (Manski, 1989). Even students with low grades and minimal credits may receive some payoff in the labor market relative to students who never attended college. Moreover, while failing SAP at the end of the first year may have negative consequences for some students, it is possible that the existence of performance standards shifts the entire distribution of performance up in the first year, so that fewer students are near the cutoff in the first place (an effect which is outside the scope of the present analysis). At the same

time, it is important to note that, while poor academic performance is widespread (across institutional sectors and student demographics), SAP policy targets undergraduates from America's most disadvantaged families (most Pell recipients come from families earning under $40,000 annually)—those in greatest need of support in order to attain a degree and who stand to benefit the most from degree attainment (Baum & Payea, 2013). The main conclusions we can draw at this point are simple: Many Pell recipients are at risk of losing aid due to SAP failure, and this appears to have consequences for students' future persistence and degree attainment. It is not clear that policymakers, college administrators, and students are aware of the magnitude of this risk.

2. Background

Students From Low-Income Families, Need-Based Aid, and Navigating College

Despite national efforts to improve college attainment, including significant spending on financial aid over the last 40 years, the relationship between family income and college attainment is stronger than ever (Alon, 2009; Bastedo & Jaquette, 2011). While the enrollment gap between children born in the bottom and top income quartiles appears to be shrinking (albeit slowly), the completion gap is large and persistent. This is likely because students from low-income families face considerable hurdles to persisting once enrolled in college.

Many low-income students are first-generation college attendees and may be less psychologically and culturally prepared to navigate college (Haveman & Smeeding, 2006). Students from low-income families may arrive at college academically underprepared for postsecondary coursework, due at least partially to socioeconomic residential segregation and their concentration in resource-constrained school districts (Goldrick-Rab, Kelchen, Harris, & Benson, 2014; Lareau & Cox, 2011; Long, Conger, & Iatarola, 2012). Low-income students are also more likely to work for pay during college than their peers, minimizing the time they have available to study and to interact with faculty and classmates (Belley & Lochner, 2007; Benson & Goldrick-Rab, 2011; Bozick, 2007; Roksa & Velez, 2010).

Need-based financial aid aims to offset the challenges faced by low-income students by alleviating financial constraints. This public policy is one of the most expensive higher education policies in the United States, but mounting evidence suggests it has the potential to reduce socioeconomic gaps in college outcomes. Financial aid through grants is linked with reduced college dropout behavior (Bettinger, 2004); decreased need to work for pay (Benson & Goldrick-Rab, 2011; Schudde, 2013); and increased attendance, persistence, credit accumulation, learning, and degree attainment (Arum & Roksa, 2011; Castleman & Long, 2013; Dynarski, 2003; Goldrick-Rab et al., 2014). This may be particularly true at community colleges. Despite arguments that "community college tuition is cheap" and that financial aid is "plentiful,"

additional aid dollars appear to be the largest determinant of students' graduation prospects, according to recent research by Attewell et al. (2011, p. 550).

Much of our knowledge about need-based grants focuses solely on the impact of providing money, as though it were offered with no strings attached. But recent evidence suggests that the "strings"—in this case, the bureaucratic hurdles for award renewal—are potentially quite important. Today's financial aid system is complex for both students and administrators to navigate (Dynarski & Scott-Clayton, 2006, 2008; Goldrick-Rab, 2013a; Goldrick-Rab et al., 2014). For students, the uncertainty that comes with financial aid, in which awards have different eligibility standards, require reapplication for renewal, and may vary in amount over time, can create a "trajectory of college enrollment fraught with uncertainty, stress, and even fear" (Goldrick-Rab & Kendall, 2014, p. 11). While some research, reviewed below, suggests that linking financial incentives to academic requirements positively influences student outcomes, the complex requirements of financial grants may also have negative impacts.

Much of the scholarship highlighting the complexity in the Pell Grant program focuses on the process of *applying* for financial aid and determining eligibility status, and the subsequent impacts on enrollment for low-income students (e.g., Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Dynarski & Scott-Clayton, 2006; Dynarski & Wiederspan, 2012). But there are also complexities in the process for *retaining* financial aid, as many awards have different academic requirements (Goldrick-Rab, 2013b; Goldrick-Rab et al., 2014). Competing award requirements may be difficult to master and interpret. Because the purpose of financial aid is to offset financial constraints for college students, federal financial aid policy should, at the least, be designed to do no harm to students (Scott-Clayton, 2013). But complexity of navigating financial aid, even after initially receiving the award, may undermine this simple goal. In the next section, we theorize how tying academic performance to need-based financial aid influences student outcomes by examining two competing, though not mutually exclusive, hypotheses.

Academic Performance Standards: Incentivizing Effort and Discouraging Persistence?

SAP standards complicate the already intricate process of using federal financial assistance to attend college. Extant research on SAP policies is sparse, dated, and limited to descriptive studies of policy implementation within individual institutions (e.g., Bennett & Grothe, 1982; McNair & Taylor, 1988). To guide our thinking as we examine the potential implications of SAP policies, we turn to related literature about performance standards for financial aid recipients and academic probation policies.

Performance-based aid. Scott-Clayton (2011a) argues that financial aid with academic requirements may improve student outcomes through two potential mechanisms. First, financial aid offsets the cost of college, reducing the need for student employment. This enables students to spend more time on coursework, potentially speeding their progress toward a degree. Second, annual achievement requirements for award renewal may offer direct incentives to increase

academic effort, aligning students' incentives with their funders' preferences (Scott-Clayton, 2011a, p. 615).

Research on West Virginia's PROMISE scholarship suggests that both mechanisms, cost reduction and incentivized effort, may be at play (Scott-Clayton, 2011a). While the PROMISE scholarship requires that students qualify for the program by meeting initial academic requirements, it also specifies that they must maintain a minimum GPA and course load to retain the scholarship. In her evaluation of PROMISE's effects, Scott-Clayton (2011a) suggests that the program's substantial impacts on cumulative GPA and total credits earned in the first year, along with its moderate four-year impacts on GPA and credit accumulation, support the notion that academic incentives promote improved academic achievement. The null impacts of PROMISE receipt on persistence and weekly school-year earnings—the two measures that are likely most sensitive to cost-of-college effects—suggest that reducing cost of attendance alone may not induce improvements in college outcomes, though, as Scott-Clayton notes, "this hardly implies that costs are irrelevant. Perhaps the only reason why incentives work is because students face credit constraints" (p. 644).

Still, similar research on Georgia's HOPE Scholarship Program finds that most merit aid recipients lose their scholarships due to eligibility requirements for renewal. Henry, Rubenstein, and Bugler (2004) argue that the positive impacts of the scholarship on persistence and graduation are only significant for those who maintain eligibility. In other words, retention of financial aid is critical to improving the outcomes of students.

It is difficult to generalize the findings of the PROMISE or HOPE programs to recipients of need-based aid because students receiving need-based financial aid differ systematically from those who are not receiving need-based aid. The background characteristics of need-based aid recipients are highly correlated with dropout behavior (Bettinger, 2004). While PROMISE-style programs illustrate the effectiveness of incentives for a population with demonstrated prior academic success, we cannot necessarily apply the same expectations to other populations. Furthermore, the success of many merit-based and performance-based scholarships "relies in part on the existence of a *wholly need-based program like Pell* that serves as the foundation of financial support" (Baum & Scott-Clayton, 2013, p. 11; emphasis added). As we show below, however, the Pell program is performance-based when it comes to renewal beyond the first year.

Performance-based scholarships have some striking similarities to the Pell program. Unlike merit scholarships, they are not awarded based on prior achievement; rather, they are need-based grants that students can earn by meeting specific academic benchmarks over the course of a term (Welbeck, Ware, Cerna, & Valenzuela, 2014). In MDRC's recent guide for establishing performance-based scholarship programs, the authors mention enrollment in a minimum number of credits and course grades (such as a GPA of at least 2.0) as frequently used benchmarks (Welbeck et al., 2014, p. 2). The benchmarks are quite similar to those already imposed upon Pell recipients.

Proponents of performance-based scholarships argue that the awards fill the gap between students' level of need and their level of financial aid (as they, unlike the Pell, are a form of supplemental aid). They offer a "meaningful incentive to stay in school and make progress toward a degree" by encouraging students to focus on their studies (Welbeck et al., 2014, p. 4). Financial incentives are offered at multiple time points throughout the semester if students meet performance benchmarks (Patel, Richburg-Hayes, de la Campa, & Rudd, 2013). Advocates expect to see better performance in courses; faster progression through degree requirements; and, in the long term, higher rates of graduation and transfer to four-year colleges (Patel et al., 2013).

Performance-based scholarship programs appear to meet some of those expectations. The Opening Doors Demonstration in Louisiana increased rates of retention in the second semester and credit accumulation in the first two semesters (Richburg-Hayes et al., 2009). The promising short-term results inspired the launch of the national Performance-Based Scholarship Demonstration in 2008, which aimed to evaluate the effectiveness of performance-based scholarships among low-income students in various geographical locations with different amounts of money over different durations of time. The Performance-Based Scholarship Demonstration results, thus far, are modest. While the scholarships increased credits earned in the first year, they do not appear to have significantly increased persistence into the second year of college (Patel et al., 2013; Patel & Valenzuela, 2013).

Academic probation. Performance-based scholarship advocates argue that performance standards should incentivize effort through the positive rewards they offer for those who meet performance standards. But what happens when policies are structured to provide negative consequences for failure to meet standards? Academic probation policies often follow that structure—students with a GPA below a certain threshold are placed on probation and met with a threat of punishment (for instance, suspension) if they fail to improve their grades. The driving theory behind performance standards such as those employed in academic probation is that they weed out students who have little chance of success and motivate those most likely to succeed (Bénabou & Tirole, 2002). It is likely that the motivation for the SAP requirements for Title IV recipients is similar, though we cannot ascertain the motivation from policy documents.

Recent research suggests that when academic standing is evaluated at the end of the first year, it discourages some students from returning while improving the performance of others (Lindo, Sanders, & Oreopoulos, 2010). The authors evaluate the academic probation policy at three campuses of a large Canadian university, using a regression discontinuity research design. Comparing students with a GPA just above the academic probation threshold with those whose GPA is just below the threshold, they find that some students are discouraged from returning, but those who reenroll improve their academic performance. At first glance, this aligns with the "weeding out" hypothesis. However, the impacts of academic probation vary across students based on prior achievement, gender, and native language. Of greatest note, academic probation appears to have a strong negative effect on degree attainment among high-ability students (i.e., students with higher achievement in high school). Overall, the authors conclude that being placed on academic probation negatively impacts students' perceptions of their ability, and that

students with prior academic success were subject to greater shock when notified of their failure to meet academic standards (Lindo et al., 2010, p. 23).

SAP standards have many similarities to academic probation standards. Much like being put on academic probation, failing to make satisfactory academic progress has delayed consequences. Initially, the only consequence is notification of failure to meet academic expectations. Notification alone may discourage some students from returning and have the unintended consequence of discouraging students who could otherwise succeed in college. The most severe consequence of failing to meet SAP standards, ineligibility for federal aid, is further delayed. If students become ineligible for the Pell Grant, their net price of attending college increases by at least the size of their Pell Grant (or more, if they received other sources of financial aid that were tied to Pell receipt).

While the threat of Pell loss could serve as a motivation to improve student effort and academic progress, this is more likely occur if aid recipients who fail to meet academic standards early in college are embedded in strong academic support and communication systems (i.e., if students receive notification of their status and what it means, and are connected with the academic supports necessary to improve their status). Institutional policies may recommend academic intervention for students who fail to meet SAP standards and appeal for financial aid renewal. However, offices on community college campuses are often "loosely coupled"—the actions of one office may not reflect those in another (Meyer & Rowan, 1978; Weick, 1976). If the financial aid officers and the academic advisers locally adapt policies with little communication between the offices, early academic intervention is unlikely (Goldrick-Rab, 2013b). A loosely coupled system may contribute to information constraints where students are not entirely aware of institutional SAP policies, how SAP status affects Pell eligibility, and how to improve their SAP status; subsequently, students in loosely coupled systems struggle to navigate college pathways (Rosenbaum, Deil-Amen, & Person, 2006; Scott-Clayton, 2011b, 2013).

Under current institutional policy in our state sample (details of which are explained in the next section), students who fail to meet SAP requirements after their first semester receive a written warning, followed by a semester-long "warning period." Those who continue to fail to meet standards risk losing Pell eligibility the following semester. There are no formal academic interventions for Pell recipients who fail to meet SAP requirements.

Satisfactory Academic Progress, as Defined by the Pell Grant Program

Origins of SAP and federal/institutional roles. In 1976, the term "academic progress" was introduced into federal financial aid legislation as an amendment to the Higher Education Act of 1965. The amendment stipulated that, to receive financial assistance under Title IV, students must demonstrate "satisfactory progress" toward a degree (Bennett & Grothe, 1982). The legislation did not explicitly define satisfactory progress, but the Interim Final Regulations in 1978 stated that an institution should evaluate progress by establishing a "normal time frame" for completing the course of study and by measuring grades or work "against a norm" (Bennett

& Grothe, 1982, p. 1). Since then, the policy has evolved to be more explicit in its terms while still allowing institutions to determine, within certain confines, how best to evaluate academic progress.

Today, students receiving federal financial assistance must be evaluated at the end of each academic year by their institution. Per the Higher Education Act, an institution's definition of SAP must, at the least, align with its standards for graduation, although the timeline for evaluation differs (Student Eligibility, 2013, p. 571). The Code of Federal Regulations provides some additional guidance for institutional evaluation of student progress. Institutions must set a "qualitative standard," in which students must meet a GPA of 2.0 or its academic equivalent by the end of their second academic year; a "quantitative standard," in which there is a "minimum percentage of work" successfully completed; and a "maximum timeframe" standard, which requires students to finish a program within at least 150 percent of its published length (Satisfactory Academic Progress, 2013, p. 546).

The language of the federal policy offers some flexibility. SAP must be evaluated at the end of each academic year, but the determination of satisfactory progress is left up to the institution, so long as it requires a 2.0 cumulative GPA by the end of the second year, assesses how much work students complete, and sets a maximum time frame standard. Perhaps more importantly, the institution's policy must be "at least as strict" as the academic policy applied to students not receiving assistance from Title IV programs (Satisfactory Academic Progress, 2013, p. 546).

Students who do not meet an institution's SAP standards become ineligible to receive federal financial aid. However, students able to demonstrate they faced "undue hardship" may be exempt from the consequences, at least initially (Student Eligibility, 2013, p. 571). The federal legislation includes an appeals clause, allowing institutions to waive the provisions of the SAP policy if a student faces the death of a relative, personal injury or illness, or "any special circumstances as determined by the institution" (Student Eligibility, 2013, p. 571).

In 2011, the federal policy was changed to include a warning period. The new legislation requires institutions to warn students prior to the termination of federal funding. While the policy change does not, technically, require more frequent assessment of SAP, it may in practice. Evaluation now "must occur at the end of each payment period" for programs longer than an academic year (Rules and Regulations, 2010, p. 66882). Institutions evaluating SAP at the end of the academic year may need to evaluate more frequently in order to offer students a warning period before financial aid termination (Rules and Regulations, 2010). Many critics responded that the "one-semester rule" had a "profound" impact on their students (Ashford, 2012). Under the previous policy, some colleges elected to evaluate students at the end of each academic year, and then applied a warning period to those who failed to meet SAP after that point. For those colleges, the new policy shifts the warning period one semester earlier.

Rules in effect for students in our state administrative sample. In this study, we explore the application of SAP guidelines within a state community college system that evaluates

satisfactory academic progress at the end of each term. Per the policy, students are meeting SAP requirements at the end of each term if they have a cumulative GPA of 2.0 or higher, complete at least 67 percent of all credit hours attempted, and complete their program of study within 150 percent of the expected time frame. At the end of each term, the college notifies students of their SAP status. The statuses include *satisfactory*, *warning*, *termination*, and *probation-by-appeal*. Students who meet the minimum SAP standards are deemed satisfactory, while students who have not earned the required GPA or credit completion rate are placed on warning for the subsequent semester. Students on warning are able to receive aid but risk financial aid termination if they continue to fail to meet SAP standards. Upon failing to meet SAP standards during their warning term, they must appeal to continue receiving federal and state financial aid. Financial aid is terminated for students who do not appeal or who make an unsuccessful appeal attempt. Students with successful appeals enter a probation-by-appeal period of one term. During this period, they receive financial aid but must create an academic plan to meet SAP requirements. There are no set policies requiring a specific academic intervention for students on probation, just the "academic plan" worked out with a financial aid officer. Students on probation-by-appeal who fail to meet SAP standards lose financial aid eligibility.

3. Data

We use several sources of data to explore the prevalence and consequences of SAP failure. To highlight national trends, we rely upon three waves of data on undergraduates from the National Postsecondary Student Aid Survey (NPSAS) in 2004, 2008, and 2012. The NPSAS examines the characteristics of a nationally representative sample of postsecondary students. It includes data on students' background, academics, and financial aid for a single year and collects information from a range of sources, including student surveys, academic transcripts, and administrative financial aid records.

While the NPSAS is nationally representative of college students, it includes older students who have prior college experience. Because many students drop out of college after the first year, the NPSAS sample overall is more academically selective (because it includes second years, third years, etc.) than a sample of beginning students, such as the Beginning Postsecondary Students Longitudinal Study. In our analysis of national trends, we limit the NPSAS sample to "first-year" students; however, the variable we use in the NPSAS data is based on academic standing rather than timing of initial enrollment. As a result, the NPSAS "first-year" students are not precisely equivalent to students who are in their first academic year.

To explore the prevalence, trends, and consequences of SAP failure at a more granular level, we turn to administrative data from a state community college system (SCCS) that includes over 50 separate public two-year institutions. We restrict the sample to focus on cohorts with at least three years of follow-up data to track enrollment and transfer behavior, as well as

early degree attainment. The analytic dataset includes a pooled sample of 173,312 students, 50,008 of whom received Pell Grants, from six cohorts of fall-term enrollees (2002–2007).

The state administrative data track federal and state aid and transcript measures, including courses, credits attempted and completed, and grades for each term. The data are derived from three sources: SCCS data with student information on demographics, transcripts, and financial aid; National Student Clearinghouse graduation data; and Employment Security Commission earnings data. Our analytic dataset includes student background measures, including race (collected by the SCCS as White, Black, "other race," or Hispanic), gender, age at college entry, state residency status, dependency status for financial aid purposes, and high school graduation status. We are able to capture whether students work for pay while enrolled, their earnings during their first semester (as a proxy for the amount worked during initial enrollment), and their expected family contribution (EFC) for financial aid purposes. Finally, we track students for three years after college entry to paint a picture of how SAP failure impacts college outcomes. To understand how SAP failure impacts immediate persistence and achievement, we examine enrollment and GPA in the first term of the second year of college. To explore the implications of SAP policy for early degree and transfer outcomes, we examine certificate and associate degree attainment and transfer to a four-year college.

To demonstrate how the students in our state administrative data compare to community college students across the nation, we present sample means for community college students (broken into Pell and non-Pell students, based on Pell receipt at college entrance) in the 2004/2009 Beginning Postsecondary Students Longitudinal Study (BPS:04/09) and our pooled state administrative data (see Table 1). The BPS is a longitudinal study following a nationally representative sample of first-time college students, a subset of students from the NPSAS 2004. It includes data on students' background, academics, and financial aid, drawing information from a range of sources, including student surveys, academic transcripts, and administrative financial aid records.

Students in the SCCS sample are, on average, older than those in the national sample. While both the BPS and the SCCS samples represent first-time college students, it is possible that there is variation in the age of first-time college students across states (perhaps reflecting differences in labor markets and college costs). In both the state and national data, half of Pell recipients are White, compared with approximately three quarters of non-Pell students. Approximately 70 percent of Pell recipients and 50 percent of non-Pell students are female in each sample.

Table 1: Descriptive Statistics: National and State Samples of Community College Students

	BPS		SCCS	
Variable	Non-Pell	Pell	Non-Pell	Pell
White	.735	.517	.739	.516
	(.442)	(.499)	(.439)	(.360)
Black	.090	.271	.153	.380
	(.286)	(.445)	(.360)	(.485)
Asian	.044	.037		
	(.206)	(.188)		
Other race/ethnicity	.105	.149	.070	.079
	(.306)	(.356)	(.255)	(.270)
Hispanic	.135	.164	.038	.025
	(.341)	(.370)	(.190)	(.025)
Female	.526	.705	.508	.673
	(.499)	(.456)	(.500)	(.469)
Age	21.875	22.257	24.008	23.415
	(7.849)	(6.884)	(9.375)	(7.926)
State resident	.954	.972	.880	.953
	(.210)	(.165)	(.324)	(.212)
Dependent	.668	.567	.113	.519
	(.471)	(.495)	(.316)	(.500)
Work for pay	.786	.694	.557	.478
	(.410)	(.461)	(.497)	(.500)
First semester earnings ($)			178.76	133.31
			(272.54)	(179.27)
High school graduate	.879	0.847	.797	.884
	(.326)	(0.359)	(.402)	(.320)
Expected family contribution ($)	11,632.41	899.42	4,166.93	765.43
	(14,314.19)	(1,163.75)	(7,841.82)	(1,234.94)
N	2,900	1,620	123,304	50,008

Note. Table shows averages for Pell and non-Pell community college entrants from the BPS:04/09 ($N = 4,520$) and state administrative data from fall entry cohorts from 2002–2007 ($N = 173,312$). We used survey weights for the BPS data, which represents 1,144,570 students nationally, including a subpopulation of 299,810 Pell recipients and 844,760 non-Pell students. In correspondence with National Center for Education Statistics requirements, all sample sizes for the BPS are rounded to the nearest 10.

Financially, the national and state samples differ across dependency status, employment status while enrolled, and EFC. Among Pell recipients, a similar proportion filed as financial dependents across the two samples—52 percent of students in the SCCS and 57 percent in the BPS. In the SCCS, the majority of the non-Pell students did not file for financial aid and therefore are considered "not dependent" for financial aid purposes (the dependency status is unknown and/or not applicable for two thirds of these students). Twenty-two percent fewer Pell recipients and 23 percent fewer non-Pell students worked for pay during the first semester in the SCCS than in the BPS. Finally, the EFC of non-Pell students in the national sample is much higher than in the SCCS. The financial differences are likely driven by the lower costs of attendance in the SCCS than in other public two-year systems. In the most recent cohort in our analytic sample (2007–2008), the maximum annual tuition and fees (16 credits per semester) at an SCCS college cost students approximately $1,475, about half of the national average of $2,708 for public two-year colleges (U.S. Department of Education, National Center for Education Statistics, 2013).

4. Methods

We use several analytic approaches to examine the magnitude of SAP failure and its effects. First, we demonstrate the prevalence of failure to meet SAP standards using summary statistics from the national and SCCS samples. To dig deeper into the effects of the policy, we use longitudinal SCCS administrative data and regression discontinuity (RD) and difference-in-differences (DD) approaches to compare students who fall above and below the SAP threshold for GPA.

Failure to meet SAP standards occurs when students fail to achieve a cumulative 2.0 GPA, to achieve a .67 credit ratio of credits attempted/credits earned, or to complete their program within 150 percent of the maximum stated time frame. Due to variation in maximum time frame across programs, we focus on the GPA and credit ratio requirements to study descriptive patterns. We then exploit the 2.0 GPA threshold, using cumulative GPA at the end of the first year of college (when students are evaluated for Pell renewal for the fall of their second year) to test the impacts of SAP on community college student persistence, transfer behavior, and degree attainment. The variation in cumulative GPA allows us to examine impacts around the cutoff, unlike the measure of credit ratios, which does not offer enough variation to estimate the effect of SAP failure. In our regression discontinuity and differences-in-differences analyses, SAP failure is determined by whether a student's cumulative GPA falls below the 2.0 cutoff.

Regression Discontinuity

Our RD analysis relies on the assumption that, if student characteristics are evenly distributed across the "treatment" threshold (the 2.0 GPA cutoff), we can attribute any differences in outcomes across the threshold to the policy (Imbens & Lemieux, 2008). Using the approach, we estimate the difference between two regression functions at the cutoff—one estimated below and the other estimated above. The RD estimator is the difference between the two regression functions at the cutoff.

To estimate the effect of SAP, we focus on students whose cumulative GPA falls near the cutoff—an approach referred to as local linear regression because the estimated RD impact is "local" to the cutoff, relying on a narrow bandwidth of GPAs (Hahn, Todd, & Van der Klaauw, 2001). The rationale for the local linear approach is that focusing on the subset of observations around the cutoff should allow us to more accurately specify the functional form, reducing bias in estimation. To identify the optimal bandwidth around the cutoff, we use Calonico, Cattaneo, and Titiunik's (in press-a, in press-b) robust bias-corrected confidence intervals and Imbens and Kalyanaraman's (2012) data-driven bandwidth selection. We use a bandwidth of 0.5 as our optimal bandwidth, based on Calonico et al.'s procedure, which results in a slightly more conservative estimate. In all analyses, we test for sensitivity to bandwidth selection by using the optimal bandwidth (0.5), half the optimal bandwidth (0.25), and twice the optimal bandwidth (1.0).

The basic model takes the form:

$$Y_i = B_0 + \beta_1 (Below_i) + \beta_2 (Distance_i * Below_i) + \beta_3 (Distance_i * Above_i) + \varepsilon_i \quad (1)$$

where Y_i represents the outcome for student *i*, and β_1 provides an estimate of the effect of falling below the SAP cutoff on the outcome. *Below* is a binary indicator of whether or not the student's first-year GPA fell below the cutoff; *Above* indicates whether the student's GPA fell above the cutoff; *Distance* is the difference between the student's cumulative GPA and the 2.0 cutoff. ε_i is the residual component for student *i*. We run the basic model on each bandwidth (model 1 uses the optimal bandwidth; model 2, the narrow bandwidth; and model 3, the wide bandwidth).

To increase the precision of β_1 and to evaluate its sensitivity to additional covariates, we include institutional and cohort fixed effects, as well as individual-level measures, in additional models run on the optimal bandwidth. They take the form:

$$\begin{aligned} Y_i = {} & B_0 + \beta_1 (Below_i) + \beta_2 (Distance_i * Below_i) + \beta_3 (Distance_i * Above_i) \\ & + CollegeFE + CohortFE + \beta_n X_i + \varepsilon_i \end{aligned} \quad (2)$$

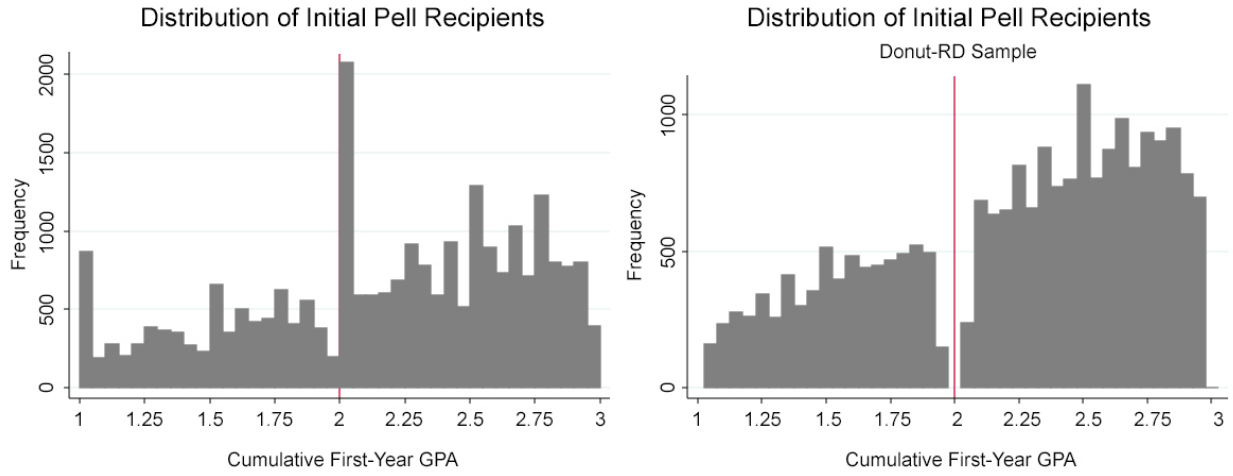
where Y_i represents the outcome for student *i*, and β_1 is the estimate of the effect of falling below the SAP cutoff on the outcome. *CollegeFE* represents a vector of institutional fixed effects (entered as a set of dummy variables indicating the institution initially attended, with one institution excluded), important because the financial aid officers responsible for implementing SAP policy are nested within institutions. *CohortFE* is a vector of cohort fixed effects, a

necessary inclusion because the implementation of SAP policy (including when and how students are provided information regarding their SAP status) may change over time. X_i represents a vector of individual-level covariates (and β_n the corresponding estimated effects on the outcome) including race, gender, age at initial enrollment, state residency status, dependency status for the purpose of financial aid, whether the student is working for pay, earnings during the first semester of college, and high school graduation status. Model 4 adds the institution and cohort fixed effects to the basic model on the optimal bandwidth (model 1), ensuring that the RD is evaluated first within the institution and cohort before aggregating into β_1 to calculate the main effect. Model 5 adds the vector of covariates to model 4 to test for sensitivity to additional covariates. We interpret the final model (model 5), which controls for institutional and cohort fixed effects, as well as student background, in the results section.

In the context of testing the impact of SAP policy, we face an additional challenge. Given the nature of the state's grading system—in which only whole letter grades are awarded—and the fact that many community college students do not accumulate a lot of credits (making them more likely to only have one or two grades comprising their cumulative GPA), we find "heaping" in whole number GPAs across the distribution. The first panel in Figure 1 shows the GPA distribution among students in our sample. To estimate discontinuities using GPA as the running variable, we first must deal with "heaping-induced bias" in our state administrative data (Barreca, Lindo, & Waddell, 2011). Following the recommendations of Barreca, Lindo, and Waddell (2011; see also Barreca, Guldi, Lindo, & Waddell, 2011), we rely on "donut-RD" estimates, dropping observations at the whole number heaps that fall within our bandwidth.[2] While "lumpy" distributions for the running variable are often taken as evidence that there is manipulation of the running variable (McCrary, 2008), we have no reason to expect that the heaping is induced by student manipulation of grades. While feasible, it is highly unlikely that students, especially since many are unaware of the SAP standards, are manipulating their course grades to fall above the cutoff. However, we agree that including the "whole" GPAs (i.e., 0.0, 1.0, 2.0, 3.0, and 4.0) introduces bias; students with whole GPAs may be less likely to persist because the presence of a whole GPA is often the result of fewer course credits contributing to the calculated average. The second panel of Figure 1 shows the distribution across the wide bandwidth after removing the heaps.

[2] A drawback of this method is that it cannot estimate how SAP impacts students who tend to be observed in the heaps (in this case, the heaps appear to include students with few credits accumulated). Still, the method is consistent with the usual motivation for RD and, based on simulations in Barreca, Lindo, and Waddell (2011), offers unbiased estimates.

Figure 1: Changes in GPA Distribution Among Pell Grant Recipients When Eliminating Heaping



Note. The first panel shows the distribution of student GPAs across the wide bandwidth (within 1 grade point of the cutoff), with heaping in the bin directly above the 2.0 cutoff. The second panel shows the distribution of student GPAs used for donut-RD analysis (in which students with "whole" GPAs are removed from analytic sample).

Source: SCCS administrative data.

Difference-in-Differences

According to federal legislation, an institution's SAP policy must be at least as strict as the academic requirements for graduation. In the SCCS, the stated academic policy for graduation and for remaining in good academic standing is a 2.0 cumulative GPA. This means that our RD estimates combine any general effects of failing institutional standards for academic performance with the specific effects of failing SAP standards for retaining financial aid. Thus, we also apply a difference-in-differences (DD) approach to compare the effects of falling below the GPA cutoff among Pell Grant recipients (who face both SAP *and* general institutional consequences) and non-Pell students (who face only general institutional consequences). In essence, we use non-Pell students as a control group for a comparison of the effects of falling below the SAP GPA standard.

The logic of DD estimation is based on the idea that outcomes are observed for two different subgroups. One of the subgroups, Pell recipients, was exposed to a policy, SAP, and some of the students within this group fell below the threshold, presumably experiencing the threat of Pell loss. The other subgroup is comprised of students who did not receive the Pell at college entrance and were not exposed to the SAP policy. When GPA values are observed in a setting of SAP exposure versus non-exposure, the difference in gains (or losses) in the unexposed non-Pell students who fell below a cumulative GPA of 2.0 is subtracted from the gains (or losses) of the SAP-exposed Pell students (those who failed to meet SAP). This approach removes biases of exposure to general academic regulations (which encourage students to stay above the 2.0 GPA mark in order to graduate).

We compare Pell and non-Pell students falling below and above the cutoff using the following basic model (model 1) on the optimal bandwidth:

$$Y_i = B_0 + \beta_1 (Pell_i * Below_i) + \beta_2 (Pell_i) + \beta_3 (Below_i) + \varepsilon_I \quad (3)$$

where Y_i represents the outcome for student *i*, *Pell* is a binary indicator of whether the student received the Pell Grant at initial enrollment, and *Below* is a binary indicator of whether or not the student's GPA fell below the cutoff. Coefficient β_1 represents the effect of falling below the 2.0 GPA threshold for students who entered college with a Pell versus those who did not (the difference-in-differences between students who fall below and above the 2.0 GPA threshold at each Pell condition). β_2 is the effect of Pell on the outcome; β_3 is the effect of falling below the cutoff on the outcome. ε_i is the residual component for student *i*.

To increase the precision of β_1 and to evaluate its sensitivity to additional covariates, we conduct a series of stepwise regression analyses, adding institutional and cohort fixed effects and individual-level covariates to the basic model:

$$Y_i = B_0 + \beta_1 (Pell_i * Below_i) + \beta_2 (Pell_i) + \beta_3 (Below_i) + CollegeFE + CohortFE + \beta_n X_i + \varepsilon_i \quad (4)$$

In this model, Y_i represents the outcome, *Pell* is a binary indicator of whether the student received the Pell Grant at initial enrollment, *Below* is a binary indicator of whether or not the student's GPA fell below the cutoff, *CollegeFE* represents a vector of institutional fixed effects, and *CohortFE* represents a vector of cohort fixed effects. Coefficient β_1 represents the effect of falling below the 2.0 GPA threshold for students who entered college with a Pell versus those who did not in a given institution and cohort. X_i represents a vector of individual-level covariates (described below) added in a series of stepwise regressions. ε_i is the residual component for student *i*.

In model 2, we add in institutional and cohort fixed effects to control for variation across institutions and students who enter college in different years, but we do not yet include student-level covariates. Model 3 adds the distance of students' GPA from the cutoff ($Distance_i$) to model 2. In order to capture the variation in slopes across Pell status observed above and below the GPA threshold (see Figure 4B), model 4 adds the student's GPA relative to the cutoff, $Distance_i * Below_i$, to the previous model. Our most comprehensive model, model 5, adds measures of race, gender, age at initial enrollment, state residency status, dependency status for the purpose of financial aid, whether the student is working for pay, earnings during the first semester of college, and high school graduation status. We interpret the results from model 5 in the results section.

5. Results

How Many Students Are Potentially Affected by SAP Requirements?

We begin by isolating the GPA component of the SAP requirements, which is more uniform across institutions and also easier to construct in the national and state data. As we noted, a cumulative GPA of 2.0 is a commonly accepted GPA criterion of SAP, including in our institutional sample (where it is assessed at the end of each term, rather than at the end of each year).

National trends. Table 2 shows the percentage of first-year Pell recipients (i.e., Pell recipients with first-year academic standing) who had a cumulative GPA of less than 2.0 at the end of the year. Twenty-one percent of first-year Pell recipients in 2012 failed to meet the SAP GPA standard. The rate rose over time, particularly at public two-year colleges. While rates of first-year GPA failure in 2012 were highest at community colleges, the problem is far from unique to these institutions. First-year GPA failure rates at public four-year institutions were barely lower in 2012, and in prior years were higher than at two-year institutions.

Table 2 also shows that the issue is not unique to Pell recipients. While Pell recipients have somewhat higher rates of GPA failure than other students—not necessarily surprising, given their socioeconomic risk factors—the differences are not dramatic. In 2012, 19 percent of non-Pell first-year students would have failed to meet the GPA standard for SAP, including 21 percent of first-year students at community colleges.

Table 2: Recent National Trends in SAP GPA Failure

	Pell (%)			Non-Pell (%)		
Institution Sector	NPSAS:04	NPSAS:08	NPSAS:12	NPSAS:04	NPSAS:08	NPSAS:12
Public four-year	22.6	24.3	24.2	17.3	19.0	18.7
Private not-for-profit four-year	19.7	16.0	15.3	9.3	11.0	8.0
Public two-year	17.0	20.4	24.5	14.8	18.3	20.5
Private for-profit	13.6	16.1	15.1	8.6	12.8	12.1
Attended more than one college	14.8	15.8	18.0	12.0	12.4	13.5
Total	17.3	18.9	21.0	15.1	17.5	19.2

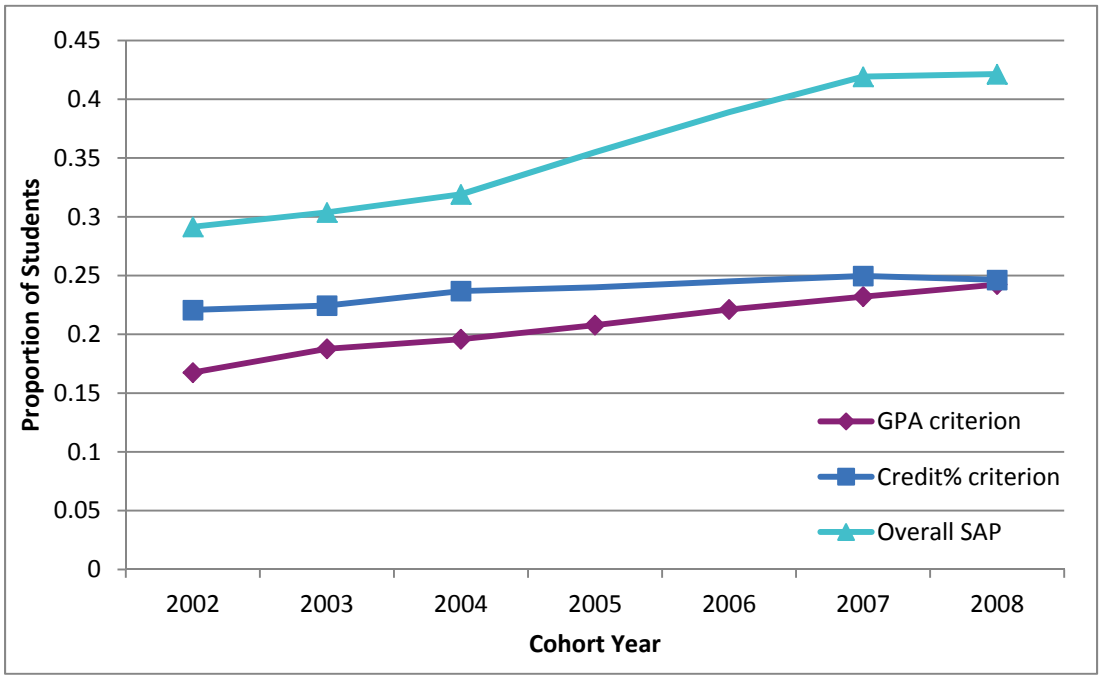
Note. Table displays percentage of students failing to achieve a 2.0 or higher GPA in the given academic year, estimated using National Postsecondary Student Aid Study 2004, 2008, and 2012 data on first-year-equivalent students.

Community college administrative data. We now move to studying patterns in our administrative data, which allow for a closer look at academic performance and subsequent outcomes. In these data, we examine the credit requirement as well as the GPA requirement for SAP. We are able to look at these measures by academic term, as they are evaluated in the SCCS, rather than by academic year. Figure 2 plots rates of failure for the GPA requirement, the credit requirement, and SAP overall between 2002 and 2008.

The figure indicates increasing rates of failure over time for the GPA standard, consistent with the national data for community colleges. For the years in which we have comparable data, the levels of failure for the GPA requirement are slightly higher in the SCCS sample. This may simply reflect regional variation, or it may be due to the fact that our administrative data represent true first-time entrants in their first term, while the NPSAS data span an entire academic year (so more data points are included in the average) and include all students with first-year academic standing.

Figure 2 also indicates that at least as many students are failing the credit standard as are failing the GPA standard. Of course, there is significant overlap between the two requirements, but accounting for students who fail either of the two standards raises the overall first-term SAP failure rate substantially, from 25 percent to 42 percent for students who entered in the fall of 2008.

Figure 2: First-Term SAP Failure Rates by Entry Cohort (All Beginning First-Years)



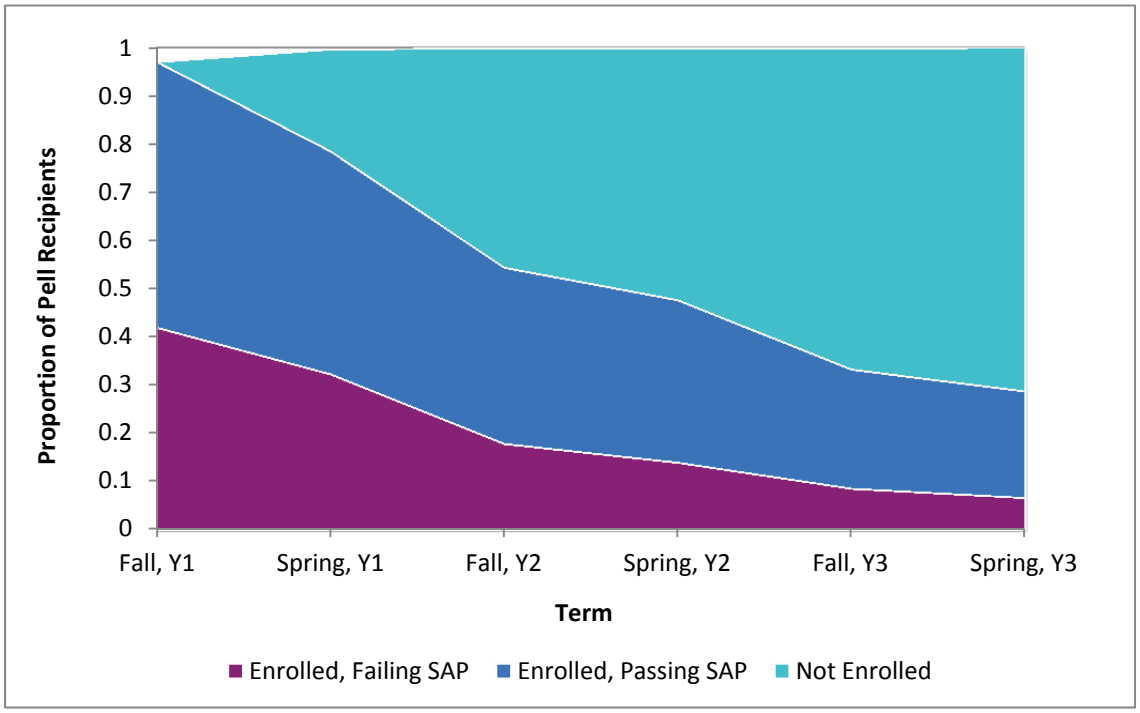
Note. $N = 173{,}312$. The figure presents the proportion of first-time SCCS students who fail to meet the GPA, credit, and, consequently, overall SAP standards within their first term of enrollment. Due to problems with the credits attempted measure in 2005 and 2006, we were unable to calculate students' credit ratio, and therefore the overall SAP failure estimate, for 2005–2006.

Source: SCCS administrative data.

What Happens to Students Who Fail SAP Over Time?

Descriptive results. To the extent that SAP failure has a consequence, it is likely show up as dropout rather than as persistence without financial aid. Figure 3 shows that SAP failure is most prevalent in the first term of enrollment. Approximately 40 percent of Pell recipients in the SCCS failed SAP in the first term. By the fall of the second year, the rate is cut in half (to 18 percent), and by the fall of the third year, the rate is halved again (to 9 percent of Pell entrants). The reduction in SAP failure appears to be a function of dropout. Figure 3 shows that the prevalence of SAP failure declines over time not because students improve their GPAs overall (though, of course, some do) but because many students simply do not reenroll, and those who fail SAP are disproportionately likely to drop out (29 percent of Pell recipients who fail SAP in the first term do not return in the spring, compared with just 13 percent of Pell recipients who meet SAP standards). The students who return in subsequent semesters are thus positively selected and less at risk of SAP failure to begin with.

Figure 3: Pell Entrants' Enrollment by SAP Status Across Academic Terms



Note. $N = 50{,}008$. The figure presents Pell entrants' enrollment and SAP status over time (excluding summer terms, when fewer students are enrolled). In the first term, a small percentage of enrolled students had no valid GPA. Otherwise, these categories are mutually exclusive and should add to 100 percent.

Source: SCCS administrative data.

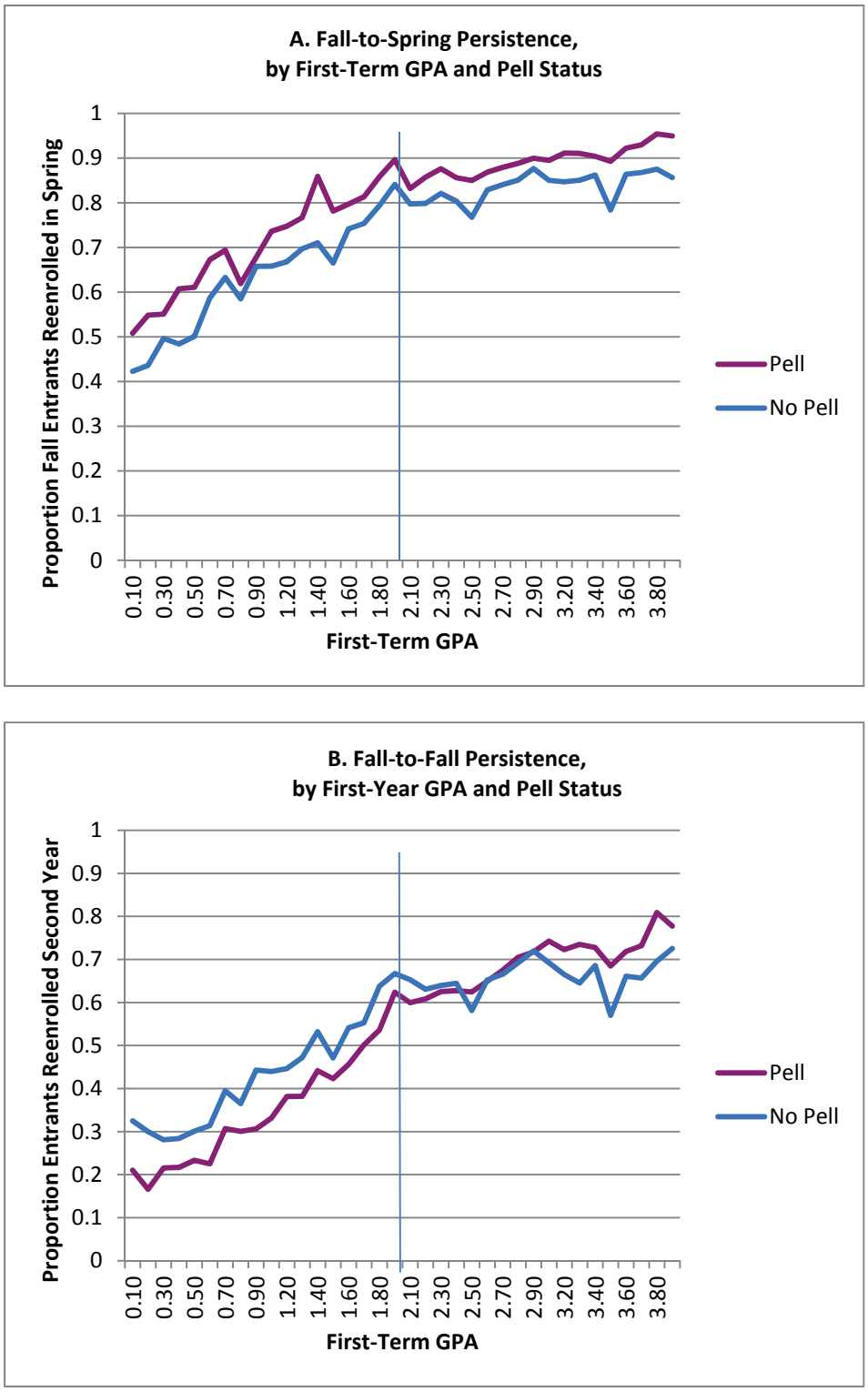
We find that, among SCCS students who remained enrolled after failing SAP, the majority continued to receive Pell Grants, likely as a result of successful appeals. In the fall term of students' second year, 92 percent of students who failed to meet SAP standards and were still enrolled continued to receive the Pell Grant. This high rate of Pell receipt continued to occur even after the stated probation period ended (students have one semester to improve their SAP status while on probation-by-appeal). Among students who continued to fail to meet SAP standards and reenrolled in the fall term of their third year, 94 percent received the Pell. While this may sound alarming, these students represent a very small percentage of the population—6 percent—because only about 7 percent of students who continued to fail to meet SAP standards remained enrolled for that long.

While students who fail to meet SAP requirements are more likely to drop out, the difference in retention rates between those who do and do not fail SAP has no obvious causal interpretation. The preexisting factors that lead to low GPAs likely also lead to low persistence rates. Moreover, since SAP rules for Pell typically correspond to institutions' broader academic progress requirements, it is difficult to separately identify the Pell-related consequences of SAP failure.

There are several ways to parse out the effects of SAP failure. One way to approach this issue is to compare the Pell recipients directly above and below the cutoff using a regression discontinuity design. Another is to look at persistence rates by GPA for those with and without Pell Grants, to allow for a difference-in-differences analysis. Figure 4 provides preliminary evidence for both of these methods, plotting GPA and persistence over time for Pell and non-Pell students. Panel A looks at fall-to-spring persistence by first-term GPA, while panel B looks at fall-to-fall persistence by cumulative first-year GPA (those who drop out during the first year remain in the sample, and have their GPA at exit carried forward).

Interestingly, panel A indicates that Pell recipients persist to the spring term at higher rates than non-Pell students across the GPA spectrum. We do not see any strong changes in patterns of persistence around the 2.0 GPA cutoff, nor do we particularly expect to see any, given that there are no distinct consequences for falling below this threshold until at least the second year (unless there are discouragement effects from receiving a warning status). Panel B looks quite different. Here, students below the 2.0 GPA threshold who entered with Pell Grants appear to have lower rates of persistence to the subsequent fall term than non-Pell entrants with similar GPAs; above the threshold, the two groups persist at similar rates. It is plausible that the SAP rules embedded in the Pell Grant program help explain these patterns: The threat of losing the Pell due to SAP rules may discourage students who entered with the Pell from continuing to the fall of their second year. We dig deeper into these patterns in our subsequent analyses.

Figure 4. Early College Persistence Patterns for Pell and Non-Pell Students



Note. $N = 173{,}312$. In both panels, data for whole GPAs (1.00, 2.00, 3.00, and 4.00) are hidden.

Source: SCCS administrative data.

Regression discontinuity. The RD analysis is our first effort to more closely examine the potential discouragement effect of the SAP standards. To bolster support for an RD approach using students' first-year GPA as the running variable, we first test for discontinuities in covariates around the 2.0 cutoff. As demonstrated in Table 3, regressions confirm that there are no systematic differences between Pell recipients who fell directly below and above the cutoff in terms of race, age, whether the student was working for pay, whether the student graduated from high school, and several other observable measures. We find some evidence that women were more likely to fall below the cutoff than men. We include gender in our covariate-adjusted models to control for this discontinuity.

Table 3: Regression Discontinuity Estimates for Covariates

Outcomes	Optimal Bandwidth	Narrow Bandwidth	Wide Bandwidth
White	0.010	-0.009	0.022
	(0.022)	(0.036)	(0.024)
Black	-0.009	0.008	-0.015
	(0.022)	(0.036)	(0.024)
Other race	0.004	0.013	-0.002
	(0.013)	(0.021)	(0.014)
Hispanic	-0.005	-0.012	-0.005
	(0.007)	(0.011)	(0.008)
Female	0.053*	0.020	0.052*
	(0.021)	(0.035)	(0.023)
Age	-0.269	-0.282	0.003
	(0.285)	(0.460)	(0.340)
State resident	0.008	0.010	0.009
	(0.009)	(0.014)	(0.010)
Dependency status	-0.013	-0.001	-0.006
	(0.025)	(0.040)	(0.028)
Working for pay	0.014	0.002	0.025
	(0.022)	(0.036)	(0.024)
First semester earnings	2.881	2.401	9.705
	(6.722)	(11.021)	(7.878)
High school graduate	0.010	0.012	0.008
	(0.014)	(0.012)	(0.016)
N	10,578	4,445	21,884

Note. Table presents RD estimator coefficients, with standard errors in parentheses. The functional form for the optimal (0.5) and narrow (0.25) bandwidths is local linear, while the functional form for the wide (1.0) bandwidth is local quadratic.

*$p < .05$; **$p < .01$; ***$p < .001$.

Source: SCCS administrative data.

Next, we run our main RD analyses. Table 4 shows the effect of failing to meet the GPA standard for SAP at the end of the first year of college, when students in the warning period should face the threat of Pell loss, on early college persistence (reenrollment in the second year of college), first-term GPA from the second-year, certificate and associate degree attainment, and transfer to a four-year college. While we might expect to see an immediate negative impact on persistence (whether from Pell loss or discouragement due to the threat of Pell loss), the RD results do not support that hypothesis. Our results are imprecise, and small negative effects cannot be ruled out. However, our point estimates show that Pell recipients who fell immediately below the 2.0 GPA threshold were slightly more likely to reenroll in the second year than those who fell immediately above ($\beta = .038$, $SE = 0.023$ in model 5, our preferred model). This difference is not statistically significant. GPA failure had a small negative effect on longer term outcomes, such as associate degree attainment and transfer to a four-year college, but again, the differences are not statistically significant. To provide additional insight into the distribution of student outcomes across GPA, Appendix A includes figures that present the RD results graphically.

Table 4: Regression Discontinuity Effects of SAP on College Outcomes Within 3 Years of Entry

Outcomes	Model 1	Model 2	Model 3	Model 4	Model 5
Persistence into year 2	0.035	0.019	0.003	0.038	0.038
	(0.023)	(0.044)	(0.027)	(0.023)	(0.023)
First-term, second-year GPA	-0.006	0.025	-0.011	-0.006	-0.007
	(0.036)	(0.067)	(0.040)	(0.036)	(0.035)
Certificate	-0.002	-0.012	-0.006	-0.001	-0.001
	(0.005)	(0.009)	(0.006)	(0.005)	(0.005)
Associate degree	-0.008	-0.011	-0.015*	-0.007	-0.007
	(0.006)	(0.012)	(0.007)	(0.006)	(0.006)
Transfer to four-year college	-0.029	-0.027	-0.04	-0.037	-0.035
	(0.019)	(0.036)	(0.022)	(0.019)	(0.019)
N	10,578	4,445	21,884	10,578	10,578
			Specifications		
Bandwidth	0.5	0.25	1.0	0.5	0.5
Form	Linear	Linear	Quadratic	Linear	Linear
Fixed effects	No	No	No	Yes	Yes
Covariates	No	No	No	No	Yes

Note. Table presents RD estimator coefficients, with standard errors in parentheses. The functional form for the optimal (0.5) and narrow (0.25) bandwidths is local linear, while the functional form for the wide (1.0) bandwidth is local quadratic. "Fixed effects" refer to institutional and cohort fixed effects, included in the models as a series of dummy variables with the reference eliminated. To put results into context, the sample average for each outcome: persistence = 0.518, second-year GPA = 2.449, certificate = 0.023, associate degree = 0.074, transfer = 0.255.

*$p < .05$; **$p < .01$; ***$p < .001$.

Source: SCCS administrative data.

Difference-in-differences. The DD results, presented in Table 5 (see Appendix B for a graphical presentation of results), expand on the patterns observed in Figure 4, panel B. In Figure 4, panel B, differences in persistence among Pell and non-Pell students appear to be driven by differences below the GPA cutoff, as the Pell students appear to reach parity with non-Pell students a little above the 2.0 mark. The DD results, in contrast with the RD results (which focus on Pell recipients only), suggest a negative effect of SAP policy on Pell recipients by comparing the differences in outcomes above and below the threshold between Pell and non-Pell students. The DD results are also more precise. Pell students who fail to meet the GPA standard for SAP are 4 percentage points less likely to persist to the second year of college than non-Pell students who fail to earn a 2.0 GPA but do not face SAP standards ($\beta = -0.038$, $SE = 0.012$ in our preferred model, model 5).

Table 5: Difference-in-Differences Results for SAP Impact on College Outcomes

Outcomes	Model 1	Model 2	Model 3	Model 4	Model 5
Persistence into year 2	-0.040***	-0.037**	-0.039***	-0.039**	-0.038**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
First-term, second-year GPA	0.020	0.022	0.015	0.015	0.018
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Certificate	0.001	0.001	0.000	0.000	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Associate degree	0.014***	0.014***	0.013***	0.013***	0.013***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Transfer to four-year college	0.029**	0.032**	0.031**	0.031**	0.030**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
			Specifications		
Fixed effects	No	Yes	Yes	Yes	Yes
Covariates					
Distance	No	No	Yes	Yes	Yes
*Distance*Below*	No	No	No	Yes	Yes
Controls	No	No	No	No	Yes

Note. $N = 31{,}768$. Table presents DD estimator coefficients, with standard errors in parentheses. Each model is performed on the optimal (0.5) bandwidth with a linear functional form. "Fixed effects" refer to institutional and cohort fixed effects, included in the models as a series of dummy variables with the reference eliminated.

*$p < .05$; **$p < .01$; ***$p < .001$.

Source: SCCS administrative data.

While the SAP policy appears to negatively impact early college persistence, it may improve degree attainment and transfer to a four-year college among students who persist. We find a small positive effect on associate degree attainment and transfer to a four-year college within three years of college entrance. Pell recipients who failed to meet SAP standards in their first year were approximately 1 percentage point more likely to earn an associate degree and 3 percentage points more likely to transfer to a four-year college than their non-Pell peers who also fell below the 2.0 mark in their first year. Anticipating that the small positive impacts on associate degree attainment and transfer may indicate an incentivizing effect on student effort, we estimate the impact of the SAP policy's GPA standards on first-term, second-year GPA. The effect is positive but small and not statistically significant. Pell students who return for a second year of college after failing to meet the GPA standard in the first year perform almost 2 percentage points better, in terms of first-term GPA, than their non-Pell peers who also fell below a 2.0 GPA in their first year of college.

6. Discussion

In this paper, we provide preliminary evidence regarding the prevalence and consequences of students' failure to meet SAP standards, using both national data and state administrative data from community colleges. The trends highlighted in the data suggest that failure to meet academic standards is not a Pell recipient–focused phenomenon, nor is it concentrated in community colleges. While many students, not just Pell recipients, fail to meet minimum academic standards, we expect that the consequences of failing to meet academic standards are greatest for Pell recipients because they may lose their eligibility to retain financial aid. Failure to meet academic standards may be especially problematic at community colleges, where many students from low-income families and with lower academic preparation are concentrated.

A substantial portion of Pell recipients fail to meet SAP requirements. Forty percent of SCCS students failed to meet SAP requirements in 2012. If the policy has teeth and ultimately results in Pell ineligibility, it could affect a large portion of low-income students. SAP policy poses an additional hurdle for students who have financial constraints. Even if there are some incentivizing effects, the discouragement effects raise the question of how punitive policies fit into an equity agenda for American higher education. Gaining greater insight into how SAP policy sorts students is necessary to improve policy implementation.

Our descriptive evidence and the results from our DD analysis offer some evidence in support of a discouragement effect. Pell recipients (who were subject to both SAP and institutional academic progress standards) experienced greater negative effects of falling below the 2.0 GPA threshold than their non-Pell peers (who were subject to only institutional general academic standards). At the same time, we cannot entirely rule out the theory that SAP policy

may incentivize effort among some students, which may explain the higher rates of associate degree attainment and transfer to a four-year college among Pell students who failed to meet SAP standards but persisted, compared with students who were not receiving the Pell.

The small positive effect of failure to meet the SAP GPA standard on early persistence obtained from the RD analysis is imprecise and not statistically significant, and thus we caution against overinterpretation. However, it does leave open the possibility that, among Pell recipients, those who just barely fail to meet SAP standards are more likely to reenroll that those who just barely meet the requirements. This may be explained by a "second-chance" phenomenon, where students who fall below the cutoff are made aware that, while their grades are poor, they are being given a second chance and may even be targeted for additional institutional supports. Those directly above the cutoff, who are not performing substantially better, do not receive this signal of federal or institutional support and are left to interpret their academic and financial status on their own.

Another way to resolve the conflicting estimates of SAP failure's effect on early college persistence in the RD and DD analyses is to consider the goals of the two analytic approaches. The RD analysis is limited to Pell recipients, and the analysis is local to the cutoff, comparing Pell students who just missed meeting SAP requirements to Pell students who just barely met them. The RD analysis also captures the effect of academic probation in general, while the DD analysis isolates the effect of federal SAP failure above and beyond academic probation. When considering the effect on Pell recipients without a comparison group, as we do in the RD analysis, we find little evidence of significant effects of SAP standards on college outcomes. When comparing the effects of falling below a 2.0 GPA between Pell recipients and their non-Pell peers, as in the DD analysis, we see that SAP standards appear to reduce early college persistence.

We attempt to further evaluate whether SAP incentivizes effort by examining term-specific GPA immediately after students would receive notification of SAP failure and file for an appeal (in the first term of the second year). The small, positive DD estimates of SAP failure on the subsequent GPA of returning students are not statistically significant. Still, the direction of the GPA effects, combined with the positive DD impacts of SAP on degree attainment and transfer, leave the debate open. It is possible that, as Lindo and his colleagues (2010) find, there is heterogeneity by prior academic performance, and that some students are particularly susceptible to discouragement effects (in the case of academic probation, the authors found that students with previously high achievement were more likely to drop out if they failed to meet academic standards). Unfortunately, the SCCS data do not include any measure of prior achievement.

Data limitations preclude some additional analyses that also would be of interest. For example, while the SCCS administrative data provide us with measures of students' grades, credits, and outcomes, we do not have access to their SAP status, as determined by their financial aid office. It is possible that many students facing Pell loss due to SAP failure avoid negative

consequences by appealing. While federal and institutional policy suggest that students cannot delay negative effects for too long—an appeal technically only provides one additional semester to meet SAP standards, and all of the standards are cumulative—many students who remain enrolled despite repeated failure to meet SAP standards retain the Pell. Additionally, as we suggest above, additional information about students' prior achievement could help us pinpoint which students are most at risk of SAP failure and negative effects, but we do not have access to measures of precollege academic performance.

Overall, we find the DD results most compelling, both because they are more precise and because they isolate the effect of federal SAP failure. These results suggest that failing to meet SAP standards may negatively impact persistence but positively impact eventual transfer and associate degree attainment—suggesting heterogeneous effects across students. Nonetheless, drawing strong conclusions from these single-state estimates would be premature. While the analytic approaches are sound for the study's goals, the results are not always consistent with hypotheses, and the contrast between the RD and DD results suggests that more research is necessary to confirm the patterns observed here. This study serves as a point of departure from which policy scholars may continue exploring the implications of tying need-based aid to performance standards.

To implement the federal SAP policy, institutions invest resources into evaluating SAP. In the SCCS, the information gleaned from this evaluation is used to notify students of their SAP status. But the assessment of student progress could be better utilized to improve college completion among students from low-income backgrounds. Considering the magnitude of SAP failure and the resources put into its assessment, using the data to implement an early warning system—notifying students early in their college career of their academic status *and* of resources available to improve it—would be practical and potentially more effective than merely notifying students of their status (Goldrick-Rab, 2013b). Unfortunately, at most campuses, different student service offices and their staff are siloed. Even if financial aid officers are aware that students risk losing their financial aid, the students may never be contacted for academic intervention. An early warning system to notify students of SAP failure, advise them on appropriate steps for improving their academic standing, and link them with support services may be a worthwhile investment for colleges interested in improving the outcomes of low-income students. While we cannot speak to the effectiveness of more tightly coupling financial aid to academic advising and other student services, we hope that our examination of SAP policies will encourage more research in this area.

References

Alon, S. (2009). The evolution of class inequality in higher education: Competition, exclusion and adaptation. *American Sociological Review*, *74*(5), 731–755.

Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. Chicago, IL: University of Chicago Press.

Ashford, E. (2012, January 17). New regs affect students' ability to receive federal aid. *Community College Daily*. Retrieved from http://www.ccdaily.com/

Attewell, P., Heil, S., & Reisel, L. (2011). Competing explanations of undergraduate noncompletion. *American Educational Research Journal*, *48*(3), 536–559.

Bailey, M. J., & Dynarski, S. M. (2011). Inequality in postsecondary education. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity? Rising inequality, schools, and children's life choices* (pp. 117–132). New York, NY: Russell Sage Foundation.

Barreca, A. I., Guldi, M., Lindo, J. M., & Waddell, G. R. (2011). Saving babies? Revisiting the effect of very low birth weight classification. *Quarterly Journal of Economics*, *126*(4), 2117–2123.

Barreca, A. I., Lindo, J. M., & Waddell, G. R. (2011). *Heaping-induced bias in regression-discontinuity designs*. (NBER Working Paper No. 17408). Cambridge, MA: National Bureau of Economic Research.

Bastedo, M. N., & Jaquette, O. (2011). Running in place: Low-income students and the dynamics of higher education stratification. *Educational Evaluation and Policy Analysis*, *33*(3), 318–339.

Baum, S., & Payea, K. (with Kurose, C.). (2013). *Trends in student aid 2013*. Retrieved from the College Board website: http://trends.collegeboard.org/sites/default/files/student-aid-2013-full-report-140108.pdf

Baum, S., & Scott-Clayton, J. (2013). *Redesigning the Pell Grant program for the twenty-first century* (Discussion Paper No. 2013-04). Washington, DC: Brookings Institution, Hamilton Project.

Belley, P., & Lochner, L. (2007). The changing role of family income and ability in determining educational achievement. *Journal of Human Capital*, *1*(1), 37–89.

Bénabou, R., & Tirole, J. (2002). Self-confidence and personal motivation. *Quarterly Journal of Economic*s, *117*(3), 871–915.

Bennett, W., & Grothe, B. (1982). Implementation of an academic progress policy at a public urban university: A review after four years. *Journal of Student Financial Aid*, *12*(1), 33–39.

Benson, J., & Goldrick-Rab, S. (2011, August). *Putting college first: How social and financial capital impact labor market participation among low-income undergraduates*. Paper presented at the annual meeting of the American Sociological Association, Las Vegas, NV.

Bettinger, E. (2004). How financial aid affects persistence. In C. M. Hoxby (Ed.), *College choices: The economics of where to go, when to go, and how to pay for it* (pp. 207–238). Chicago, IL: University of Chicago Press.

Bettinger, E. P., Long, B. T., Oreopoulos, P., & Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *Quarterly Journal of Economics*, *127*(3), 1205–1242.

Bowen, W. G., Chingos, M. M., & McPherson, M. S. (2009). *Crossing the finish line: Completing college at America's public universities*. Princeton, NJ: Princeton University Press.

Bozick, R. (2007). Making it through the first year of college: The role of students' economic resources, employment, and living arrangements. *Sociology of Education*, *80*(3), 261–285.

Brand, J. E., & Xie, Y. (2010). Who benefits most from college? Evidence for negative selection in heterogeneous economic returns to higher education. *American Sociological Review*, *75*(2), 273–302.

Calonico, S., Cattaneo, M. D., & Titiunik, R. (in press-a). Robust data-driven inference in the regression-discontinuity design. *Stata Journal*.

Calonico, S., Cattaneo, M. D., & Titiunik, R. (in press-b). Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica*.

Cameron, S. V., & Heckman, J. J. (1998). Life cycle schooling and dynamic selection bias: Models and evidence for five cohorts of American males. *Journal of Political Economy*, *106*(2), 262–333.

Carneiro, P., & Heckman, J. J. (2002). The evidence on credit constraints in post-secondary schooling. *The Economic Journal*, *112*(482), 705–734.

Castleman, B., & Long, B. T. (2013). *Looking beyond enrollment: The causal effect of need-based grants on college access, persistence, and graduation* (NBER Working Paper No. 19306). Cambridge, MA: National Bureau of Economic Research.

Deil-Amen, R., & DeLuca, S. (2010). The underserved third: How our educational structures populate an educational underclass. *Journal of Education for Students Placed at Risk* 15, 27-50.

Deming, D., & Dynarski, S. M. (2010). College aid. In P. B. Levine & D. J. Zimmerman (Eds.), *Targeting investments in children: Fighting poverty when resources are limited* (pp. 283–302). Chicago, IL: University of Chicago Press.

Dynarski, S. M. (2003). Does aid matter? Measuring the effect of student aid on college attendance and completion. *American Economic Review*, *93*(1), 279–288.

Dynarski, S. M., & Scott-Clayton, J. E. (2006). The cost of complexity in federal student aid: Lessons from optimal tax theory and behavioral economics. *National Tax Journal*, *59*(2), 319–356.

Dynarski, S. M., & Scott-Clayton, J. E. (2008). Complexity and targeting in federal student aid: A quantitative analysis. In J. M. Poterba (Ed.), *Tax policy and the economy* (vol. 22, pp. 109–150). Chicago, IL: University of Chicago Press.

Dynarski, S. M., & Wiederspan, M. (2012). *Student aid simplification: Looking back and looking ahead* (NBER Working Paper No. 17834). Cambridge, MA: National Bureau of Economic Research.

Goldrick-Rab, S. (2013a, September 21). Rethinking financial aid's role in student retention [Blog post]. Retrieved from http://eduoptimists.blogspot.com/2013/09/rethinking-financial-aids-role-in.html

Goldrick-Rab, S. (2013b). *Increasing the impact of student financial aid: Three recommendations for financial aid administrators*. Washington, DC: HCM Strategists.

Goldrick-Rab, S., Kelchen, R., Harris, D., & Benson, J. (2014). *Reducing income inequality in higher education: Experimental evidence on the impact of financial aid on college completion*. Madison, WI: University of Wisconsin.

Goldrick-Rab, S., & Kendall, N. (2014). *Redefining college affordability: Securing America's future with a free two year college option*. Madison, WI: The EduOptimists.

Hahn, J., Todd, P., & Van der Klaauw, W. (2001). Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica*, *69*(1), 201–209.

Haveman, R., & Smeeding, T. (2006). The role of higher education in social mobility. *The Future of Children*, *16*(2), 125–150.

Heckman, J. J. (2000). Policies to foster human capital. *Research in Economics*, *45*(1), 3–56.

Henry, G. T., Rubenstein, R., & Bugler, D. T. (2004). Is HOPE enough? Impacts of receiving and losing merit-based financial aid. *Educational Policy*, *18*(5), 686–709.

Imbens, G. W., & Kalyanaraman, K. (2012). Optimal bandwidth choice for the regression discontinuity estimator. *Review of Economic Studies*, *79*(3), 933–959.

Imbens, G. W., & Lemieux, T. (2008). Regression discontinuity designs: A guide to practice. *Journal of Econometrics*, *142*(2), 615–635.

Lareau, A., & Cox, A. (2011). Social class and the transition to adulthood: Differences in parents' interactions with institutions. In M. Carlson & P. England (Eds.), *Social class and changing families in an unequal America* (pp. 134–164). Stanford, CA: Stanford University Press.

Lindo, J. M., Sanders, N. J., & Oreopoulos, P. (2010). Ability, gender, and performance standards: Evidence from academic probation. *American Economic Journal: Applied Economics*, *2*(2), 95–117.

Long, M. C., Conger, D., & Iatarola, P. (2012). Effects of high school course-taking on secondary and postsecondary success. *American Educational Research Journal*, *49*(2), 285–322.

Manski, C. F. (1989). Schooling as experimentation: A reappraisal of the postsecondary dropout phenomenon. *Economics of Education Review*, *8*(4), 305–312.

Mayer, S. E. (2010). Revisiting an old question: How much does parental income affect child outcomes? *Focus*, *27*(2), 21–26.

McNair, E., & Taylor, S. E. (1988). Satisfactory academic progress standards: Jeopardizing efforts toward educational equity? *Journal of Student Financial Aid*, *18*(1), 10–17.

Meyer, J. W., & Rowan, B. (1978). The structure of educational organizations. In M. Meyer (Ed.), *Environments and organizations* (pp. 78–109). San Francisco, CA: Jossey-Bass.

Patel, R., Richburg-Hayes, L., de la Campa, E., & Rudd, T. (2013). *Performance-based scholarships: What have we learned?* New York, NY: MDRC.

Patel, R., & Valenzuela, I. (with McDermott, D.). (2013). *Moving forward: Early findings from the Performance-Based Scholarship Demonstration in Arizona*. New York, NY: MDRC.

Richburg-Hayes, L., Brock, T., LeBlanc, A., Paxson, C., Rouse, C. E., & Barrow, L. (2009). *Rewarding persistence: Effects of a performance-based scholarship program for low-income parents*. New York, NY: MDRC.

Roksa, J., & Velez, M. (2010). When studying schooling is not enough: Incorporating employment in models of educational transitions. *Research in Social Stratification and Mobility*, *28*(1), 5–21.

Rosenbaum J. E., Deil-Amen, R., & Person, A. E. (2006). *After admission: From college access to college success*. New York, NY: Russell Sage.

Rules and Regulations, 75 Fed. Reg. 66879-66883 (October 29, 2010) (to be codified 34 C.F.R. 668.34). Retrieved from http://ifap.ed.gov/fregisters/FR102910Final.html

Satisfactory Academic Progress, 34 C.F.R. § 668.34 (2013). Electronic Code of Federal Regulations. Retrieved from http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title34/34cfr668_main_02.tpl

Schudde, L. (2013). *Heterogeneous treatment effects in higher education: Exploring variation in the effects of college experiences on student success* (Doctoral dissertation). University of Wisconsin–Madison, Madison, WI.

Scott-Clayton, J. (2011a). On money and motivation: A quasi-experimental analysis of financial incentives for college achievement. *Journal of Human Resources*, *46*(3), 614–646.

Scott-Clayton, J. (2011b). *The shapeless river: Does a lack of structure inhibit students' progress at community colleges?* (CCRC Working Paper No. 25). New York, NY: Columbia University, Teachers College, Community College Research Center.

Scott-Clayton, J. (2013). Information constraints and financial aid policy. In D. E. Heller & C. Callender (Eds.), *Student financing of higher education: A comparative perspective* (pp. 75–97). New York, NY: Routledge.

Student Eligibility, 20 u.s.c. 1091 H.E.A. § 484 (2013). Retrieved from http://www.house.gov/legcoun/Comps/HEA65_CMD.pdf

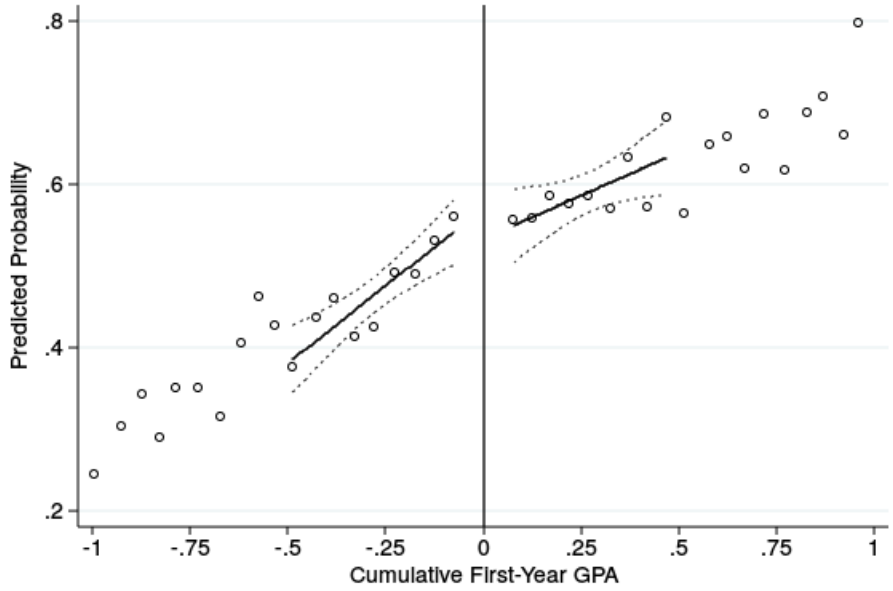
U.S. Department of Education, National Center for Education Statistics. (2013). *Digest of education statistics, 2012* (NCES 2014-015), Chapter 3, Table 381. Retrieved from http://nces.ed.gov/programs/digest/d12/tables/dt12_381.asp

Weick, K. E. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly*, *21*(1), 541–552.

Welbeck, R., Ware, M., Cerna, O., & Valenzuela, I. (with Ratledge, A., & Boynton, M.). (2014). *Paying it forward: A technical assistance guide for developing and implementing performance-based scholarships*. New York, NY: MDRC.

Appendix A: Regression Discontinuity Results

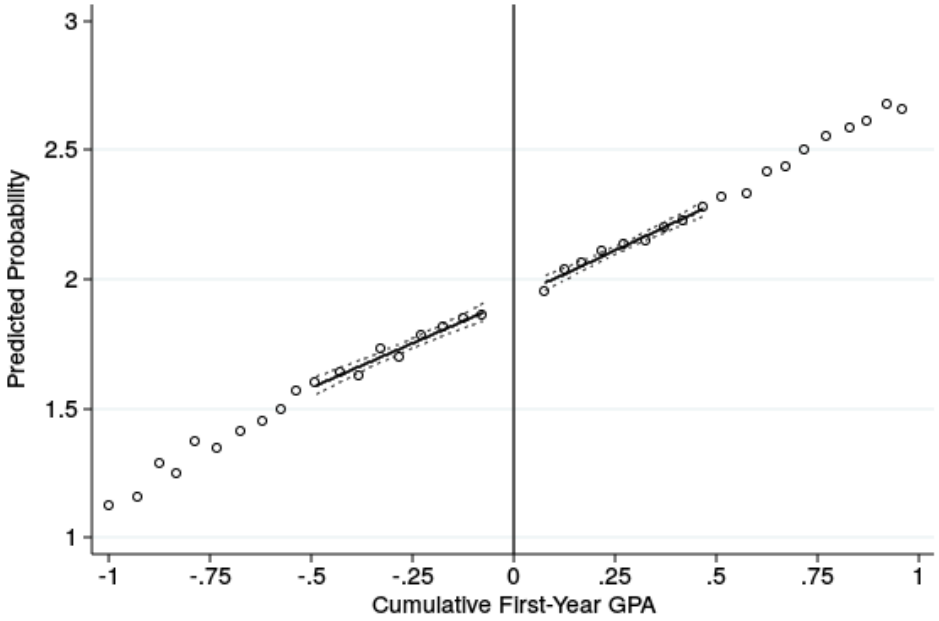
Figure A.1: Impact of SAP on Persistence Into Second Year



Note. The graph presents scatterplots of average outcomes within 0.05-point bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients on each side of the cutoff across the optimal bandwidth (0.5 grade points on each side).

Source: SCCS administrative data.

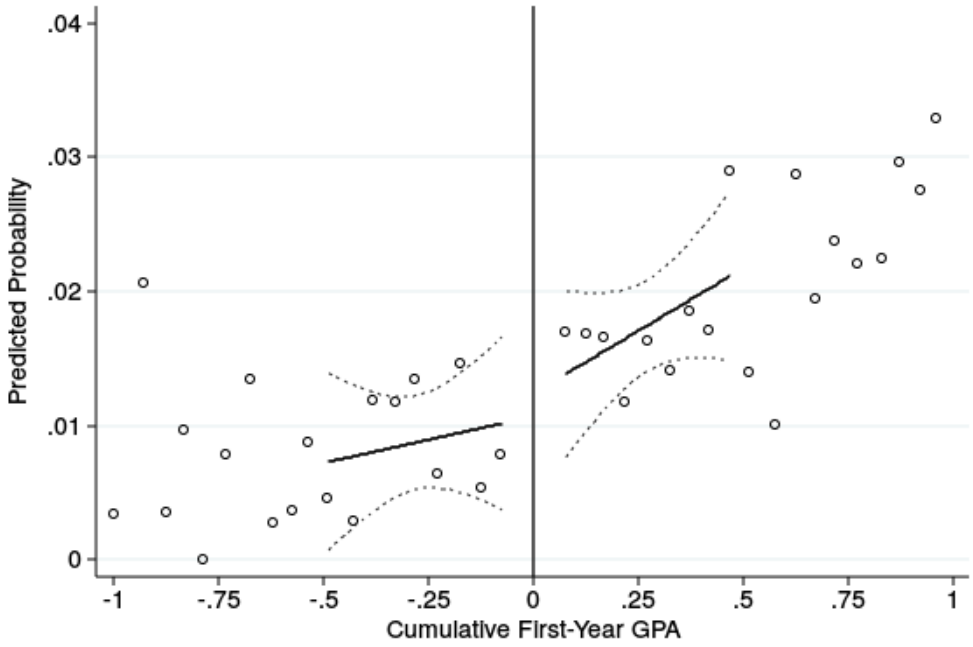
Figure A.2: Impact of SAP on First-Term, Second-Year GPA



Note. The graph presents scatterplots of average outcomes within 0.05-point bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients on each side of the cutoff across the optimal bandwidth (0.5 grade points on each side).

Source: SCCS administrative data.

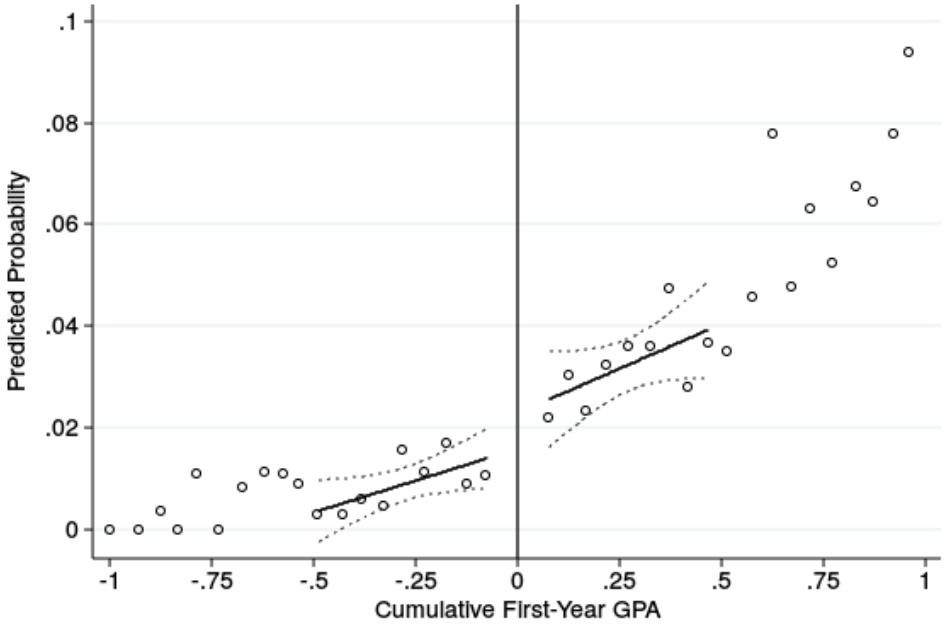
Figure A.3: Impact of SAP on Certificate Attainment Within 3 Years



Note. The graph presents scatterplots of average outcomes within 0.05-point bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients on each side of the cutoff across the optimal bandwidth (0.5 grade points on each side).

Source: SCCS administrative data.

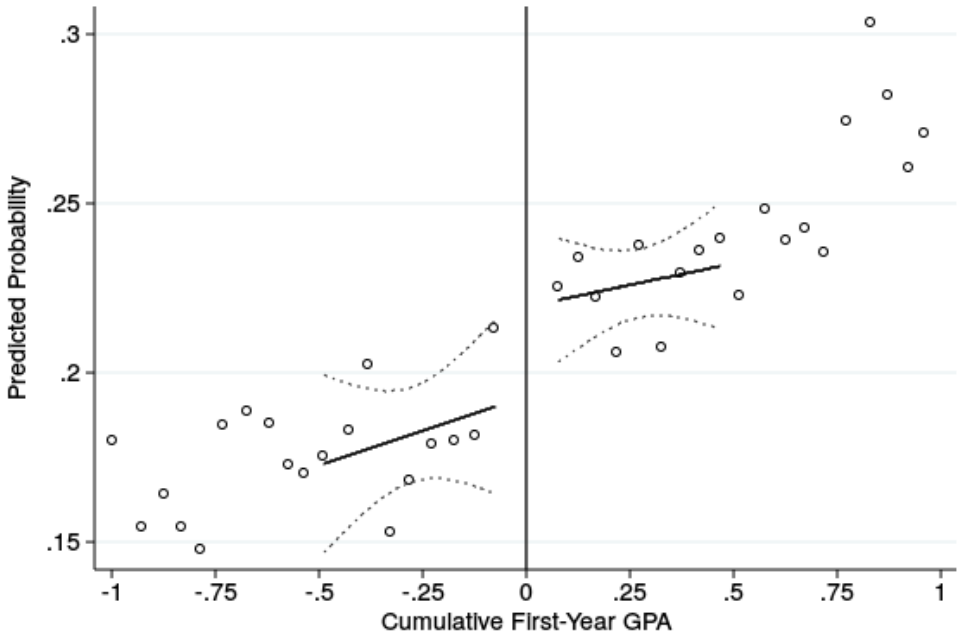
Figure A.4: Impact of SAP on Associate Degree Attainment Within 3 Years



Note. The graph presents scatterplots of average outcomes within 0.05-point bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients on each side of the cutoff across the optimal bandwidth (0.5 grade points on each side).

Source: SCCS administrative data.

Figure A.5: Impact of SAP on Transfer to a Four-Year College Within 3 Years

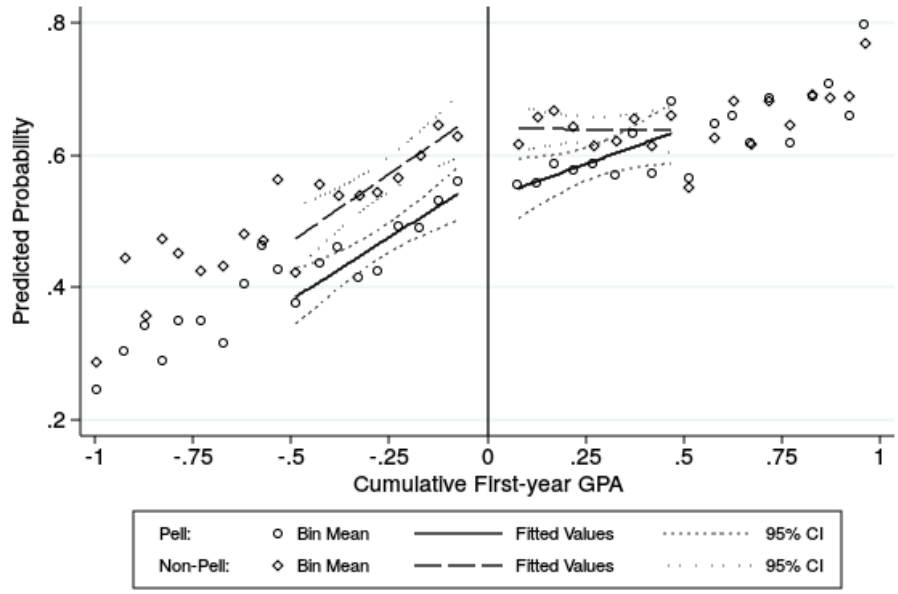


Note. The graph presents scatterplots of average outcomes within 0.05-point bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients on each side of the cutoff across the optimal bandwidth (0.5 grade points on each side).

Source: SCCS administrative data.

Appendix B: Difference-in-Differences Results

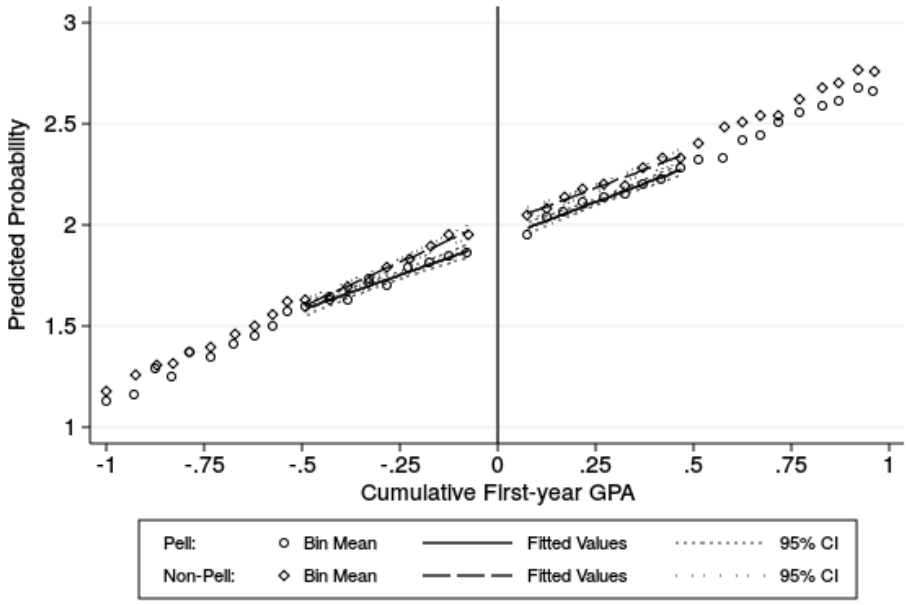
Figure B.1: Impact of SAP on Persistence Into the Second Year of College



Note. The graphs present scatterplots of the average outcomes for Pell and non-Pell students in 0.05 point-bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients (solid line) and non-Pell students (dotted line) across the optimal bandwidth (0.5 grade points on each side of the cutoff).

Source: SCCS administrative data.

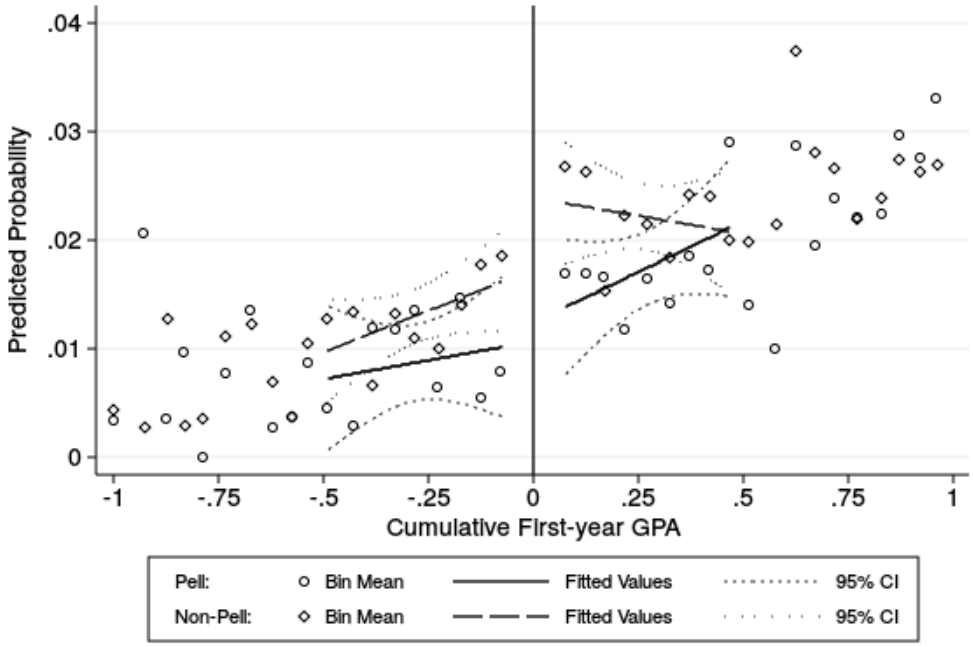
Figure B.2: Impact of SAP on First-Term, Second-Year GPA



Note. The graphs present scatterplots of the average outcomes for Pell and non-Pell students in 0.05 point-bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients (solid line) and non-Pell students (dotted line) across the optimal bandwidth (0.5 grade points on each side of the cutoff).

Source: SCCS administrative data.

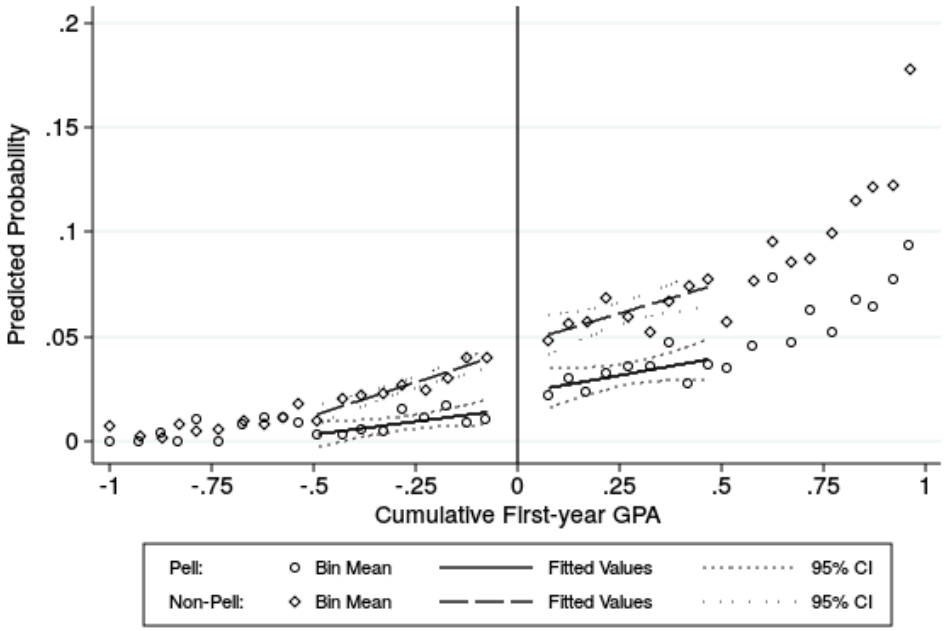
Figure B.3: Impact of SAP on Certificate Attainment Within 3 Years



Note. The graphs present scatterplots of the average outcomes for Pell and non-Pell students in 0.05 point-bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients (solid line) and non-Pell students (dotted line) across the optimal bandwidth (0.5 grade points on each side of the cutoff).

Source: SCCS administrative data.

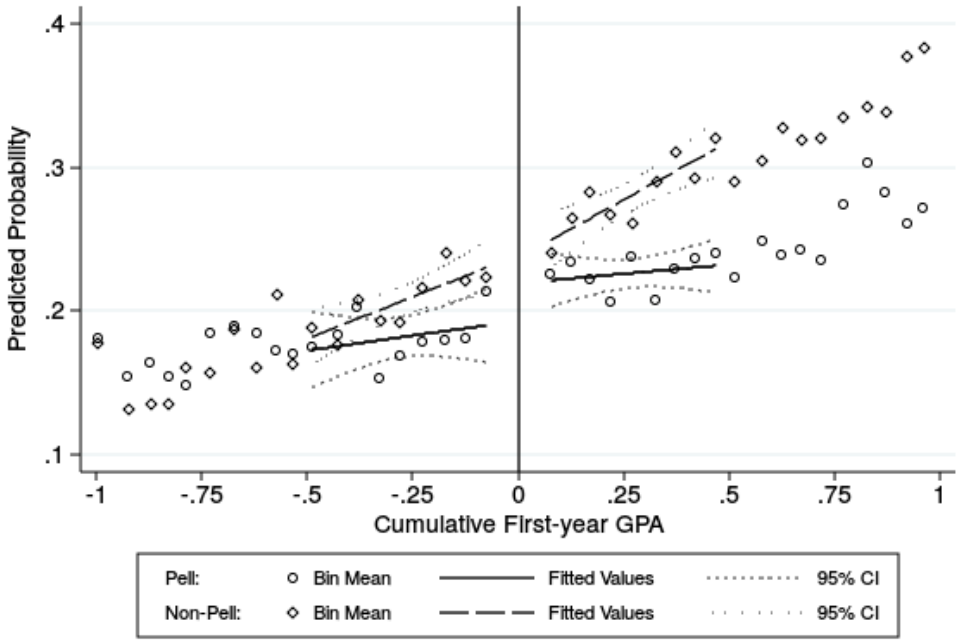
Figure B.4: Impact of SAP on Associate Degree Attainment Within 3 Years



Note. The graphs present scatterplots of the average outcomes for Pell and non-Pell students in 0.05 point-bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients (solid line) and non-Pell students (dotted line) across the optimal bandwidth (0.5 grade points on each side of the cutoff).

Source: SCCS administrative data.

Figure B.5: Impact of SAP on Transfer to a Four-Year College Within 3 Years



Note. The graphs present scatterplots of the average outcomes for Pell and non-Pell students in 0.05 point-bins across the wide bandwidth (1.0 grade points on each side of the cutoff) and fitted lines representing the average effects for Pell recipients (solid line) and non-Pell students (dotted line) across the optimal bandwidth (0.5 grade points on each side of the cutoff).

Source: SCCS administrative data.